
Maintaining transmission performance

Maintaining high transmission performance in private networks requires constant vigilance on the part of the network administrators. Experience with the Northern Telecom network demonstrates that transmission performance degrades over time. The degradation can be traced to inadequate maintenance of the facility by the supplier and administrative changes by the supplier in the assignment of equipment to provide tie trunk service.

Installation

After a tie trunk facility is installed, the installer runs a transmission test to verify that the facility meets tariffed requirements. Only after the performance has been verified is the facility ready to be turned up for service.

Scheduled maintenance

Scheduled maintenance should be performed at regular intervals whether or not trunk faults are known to exist. Testing should be carried out once a week until it is determined that less frequent testing is adequate.

Corrective maintenance

Follow-up to trouble reports generated by users or software diagnostics identifies various trunk problems in need of correction.

Transmission testing of tie trunks

ESN switches are capable of accessing a quiet termination or a 1020 Hz test tone at a remote ESN switch. These capabilities permit the testing of tie trunk transmission performance. Read *Automatic trunk maintenance description* (553-2751-104) for further information on trunk transmission testing capabilities.

Testing loss

The following test is performed at each end of each tie trunk so that both directions of transmission are checked:

- 1 From the maintenance terminal, load the trunk test program and access the remote test tone for the trunk to be tested.
- 2 Connect a transmission level meter to the “facility in” access jacks of the trunk under test. Measure the level of the 1020 Hz test tone. The permitted level requirements, based on a switched-in pad mode at the far-end switch, are given in **Table 11**.

Table 11
Transmission level requirements

Trunk design loss (dB)	Minimum (dBm)	Maximum (dBm)
0	-17.5	-11.5
0.5	-18	-12
1.0	-18.5	-12.5
1.0	-19	-13
2.0	-19.5	-13.5
2.5	-20	-14
3.0	-20.5	-14.5
3.5	-21	-15

If the requirements in **Table 11** are not met, you must isolate the fault to the trunk facility or equipment. The following test aids in this isolation. Perform the test at each end of the facility.

- 1** From the maintenance terminal, load the trunk test program and access the local test tone.
- 2** Connect a transmission level meter to the “equipment” out jack of the suspect trunk. The level requirements are
 - for QPC71 circuit packs: –15 dBm minimum, –13 dBm maximum
 - for QPC237 circuit packs: –15.5 dBm minimum, –13.5 dBm maximum

If the second requirement is not met at either or both facility ends, perform corrective maintenance and repeat the test. If the requirement is met at both facility ends, the facility supplier should perform corrective maintenance.

Testing noise

The following test is to be performed at each end of each tie trunk so that both directions of transmission are checked.

- 1 From the maintenance terminal, load the trunk test program and access the remote quiet termination for the trunk to be tested.
- 2 Connect a noise meter to the “facility in” access jacks of the trunk under test. The noise requirements are given in [Table 12](#).

Table 12
Transmission noise requirements

Distance in miles (km)	Maintenance (dBrnC)	Immediate action (dBrnC)
0–15 (0–24)	28	36
16–50 (26–80)	28	36
51–100 (82–160)	29	36
101–200 (162–320)	31	36
201–400 (322–640)	33	40
401–1000 (642–1600)	35	40
1001–1500 (1602–2400)	36	40
1501–2500 (2402–4000)	39	44
2501–4000 (4002–6400)	41	46
Note: Trunks with a noise measurement in the maintenance range may be left in service. Trunks with a noise measurement in the immediate action range should be immediately removed from service. In either case, initiate maintenance action promptly.		

If the requirements in **Table 12** are not met, you must isolate the fault to the trunk facility or equipment. The following test will accomplish this isolation. Perform the test at each end of the facility.

- 1** From the maintenance terminal, load the trunk test program and access the local quiet termination.
- 2** Connect a noise meter to the “facility out” jack of the suspect trunk. The requirement is that the noise not exceed 23 dBrnC.

If the requirement is not met at either or both facility ends, perform corrective maintenance on the appropriate Meridian 1 and repeat the test. If the requirement is met at both facility ends, the facility supplier should perform corrective maintenance.